

CLAIMS

I/We claim:

1. A system for detecting fault conditions in an audio system, the audio system including a remote audio generation device, an amplifier unit, and a wire harness connected therebetween, the system comprising:
 - an audio generation circuit;
 - a switch coupled to the audio generation circuit configured to selectively connect the audio generation circuit to the amplifier unit through the wire harness; and
 - a fault detection circuit configured to monitor an audio output of the switch to detect fault conditions and provide a control signal to a control input of the switch to selectively disconnect the audio generation circuit from the wire harness.
2. The system according to claim 1, wherein the fault detection circuit is configured to send a diagnostic signal to an audio system controller when a fault condition occurs.
3. The system according to claim 2, wherein the audio system controller stores the diagnostic signal in memory.
4. The system according to claim 1, wherein the fault detection circuit is configured to generate the control signal if the audio output is above a threshold value.
5. The system according to claim 4, wherein the fault detection circuit includes a counter, and the fault detection circuit is configured to generate the control signal if the audio output exceeds the threshold for a predetermined number of samples.

6. The system according to claim 1, wherein the fault detection circuit is configured to generate the control signal if the audio output is below a threshold value.

7. The system according to claim 6, wherein the fault detection circuit includes a counter, and the fault detection circuit is configured to generate the control signal if the audio output exceeds the threshold for a predetermined number of samples.

8. The system according to claim 1, wherein the fault detection circuit is configured to average multiple samples to generate an average output and compare the average output to a threshold.

9. The system according to claim 1, wherein the fault detection circuit is configured to delay for a predetermined time period before sampling once a fault condition has occurred.

10. The system according to claim 1, further comprising:
a transistor coupled to the switch, the transistor being configured to simultaneously control multiple outputs of the switch simultaneously.

11. The system according to claim 1, further comprising:
a first capacitor in electrical series connection between the switch and the wire harness.

12. The system according to claim 11, further comprising:
a first resistor between the switch and a power source.

13. The system according to claim 12, further comprising:
a second resistor between the wire harness and the power source.

14. The system according to claim 13, further comprising:

a second capacitor between the wire harness and an electrical ground.

15. The system according to claim 1, wherein the fault detection circuit is coupled to the audio outputs of the switch through the first capacitor.

✓ 16. A method for detecting fault conditions in an audio system, the audio system including a remote audio generation device, an amplifier unit, and a wire harness connected therebetween, the method comprising:

generating an audio signal using an audio generation circuit;

selectively connecting the audio generation circuit to the amplifier unit through the wire harness using a switch; and

monitoring an audio output of the switch to detect fault conditions; and

providing a control signal to a control input of the switch to selectively disconnect the audio generation circuit from the wire harness.

17. The method according to claim 16, further comprising providing a diagnostic signal to an audio system controller when a fault condition occurs.

18. The method according to claim 17, further comprising storing the diagnostic signal in memory.

19. The method according to claim 16, wherein the fault detection circuit is configured to generate the control signal if the audio output is above a threshold value.

20. The method according to claim 19, wherein the fault detection circuit includes a counter, and the fault detection circuit is configured to generate the control signal if the audio output exceeds the threshold for a predetermined number of samples.

21. The method according to claim 16 wherein the fault detection circuit is configured to generate the control signal if the audio output is below a threshold value.

22. The method according to claim 21, wherein the fault detection circuit includes a counter, and the fault detection circuit is configured to generate the control signal if the audio output exceeds the threshold for a predetermined number of samples.

23. The method according to claim 16, wherein monitoring the audio output includes averaging multiple samples to generate an average output and comparing the average output to a threshold.

24. The method according to claim 16, further comprising delaying for a predetermined time period before sampling once a fault condition has occurred.